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(54) Title: PIGMENT EXTENDERS

(57) Abstract

A pigment composition includes a pigment extender which optionally contains a pigment, and further includes a non-hydrogenated phospholipid material, such as non-hydrogenated lecithin, and a surface modifying agent. Suitable modifying agents are selected from fatty acids, fatty acid esters or fatty acid triglycerides, silicones and mixtures thereof.

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PIGMENT EXTENDERS

The present invention relates to pigment and/or pigment extend r compositions including a phospholipid material, cosmetic compositions including the same, and a process for preparation of such pigment and/or pigment extender compositions.

It is known in the prior art to produce conventional make-up compositions, for example powder, foundation, rouge and the like, to include a water repellent pigment having a surface coated with a silicone or metallic soap. However such pigments still only exhibit moderate water repellency and are poor in spreadability.

Many attempts have been made in the prior art to overcome the disadvantages described above. For example, it has been proposed to use, in combination with the silicone or metal soap surface treating agents, other oily substances such as mineral oils, animal oils, fatty acids and esters thereof, and paraffin and natural waxes. Whilst some improvement may be achieved in spreadability to a greater or lesser extent, such alternatives exhibit the problems of discoloration and/or evolution of disagreeable odour.

For example, United States Patent 4,622,074 to Miyoshi Kasei Co. Ltd. describes the coating of the surface of pigments or extender pigments with hydrogenated lecithin or the reaction product of hydrogenated lecithin and a metal salt, rendering the product hydrophobic.

Similarly, in United States Patent 4,863,800 to Miyoshi Kasei Co. Ltd., it is suggested to produce a pigment material including a water repellent component together with a saturated fatty acid triglyceride component. Also, in United States Patent 4,919,922 to Miyoshi Kasei Co. Ltd. it is suggested to coat the surface of the pigment with a polyolefin containing -COOR groups where R is a metal atom.

Whilst such proposals may provide some improvement in spreadability and feel, the hydrophobicity renders any nurturing value of the phospholipid unavailabl to the skin as it is sealed within th hydrophobic casing. Hydrophilicity, n th other hand, would allow the phospholipids or oth r ingredients access to the surface of the skin. A furth r advantage of hydrophilic materials is that they often allow for better skin adh sion because of its compatibility with the skin's surface.

Accordingly, it is an object of the present inv ntion to overcome, or at least alleviate, one or more of the difficulties and deficiencies related to the prior art.

Accordingly, in a first aspect there is provided a pigment composition including

a pigment extender; and

optionally a pigment;

and wherein the pigment extender and optional pigment are coated by a non-hydrogenated phospholipid material, and a surface modifying agent selected from the group consisting of fatty acids, fatty acid esters or fatty acid triglycerides, silicones, and mixtures thereof.

The pigment composition according to the present invention most preferably comprises pigment extender and a pigment wherein these components are coated with the phospholipid material and modifying agent. The composition may exhibit an improvement in skin adhesion of a cosmetic composition including same. The pigment composition may adhere to the natural moisture of the skin or moisture-created surfaces from base moisturising creams. The pigment composition may also exhibit improved appearance and texture, and does not suffer from undesired odour. As the pigment composition is hydrophilic in nature, its emulsifying activity should be increased.

The pigment composition according to the present invention is also advantageous in that it may be used in a myriad number of cosmetic applications, both of the traditional and modern type. Furthermore, the pigment composition provides the potential for a skin treatment.

The pigment or pigment extender according to this aspect of the present invention may be of an inorganic or organic type. The pigment or pigment extender may be a natural or synthetic material. Examples of pigments include: titanium dioxide, zinc oxide, zirconium dioxide, red iron oxide, yellow iron oxide, black iron oxide, ultramarine blue, Prussian blue, chromium oxide, chromium hydroxide and mixtures thereof.

Examples of pigment extenders include: talc, kaolin, natural and synthetic micas including muscovit mica, sericite, other micas, magnesium carbonate, calcium carbonate, aluminium silicate, magnesium silicat , calcium silicat , synthetic silicates, clay, bentonite, montmorillionite, calcite, chalk, titanated mica,

bismuth oxychloride, boron nitrid , silica beads, plastic beads such as acrylics, nylons including Nylon 12, natural dyestuffs and mixtures thereof, including tar dyestuff. A talc material is preferred.

A mixture of pigment and pigment extender materials may be used.

The pigment extender and, where present, the pigment most preferably comprises fine powder. Such powder may have an average particle size of approximately 10 μm (by granulometry) or approximately 4 μm (by Sedigraph determination), as found to be suitable for pigment extender comprising, for example, talc. The powder most preferably is of a relatively narrow size spectrum.

The pigment or pigment extender may be present in the pigment composition in any suitable amounts. The pigment extender may be present in amounts of from approximately 70 to 99.9% by weight, based on the dry weight of the pigment composition. Preferably the pigment extender is present in amounts of from approximately 90 to 99.4% by weight, more preferably approximately 95 to 97.5% by weight.

The pigment may be present in amounts of 0 to approximately 25% by weight, preferably approximately 5 to 10% by weight, based on the dry weight of the pigment composition.

The phospholipid material in the pigment composition according to this aspect of the present invention may be of any suitable type. A phosphatidylcholine, phosphatidylethanolamine, phosphatidylinositol and phosphatidyl serine or mixtures thereof may be used. A lecithin material is preferred, while the lecithin most preferably has a high phospholipid content. The lecithin material may be produced from a natural or synthetic source. A lecithin material refined from naturally occurring lecithin found in any suitable vegetable matter, for example soya bean, egg, corn or rapeseed may be used.

In general, the lecithin material may be or at least substantially comprise comm rcially availabl lecithin of various grades suitable for us in a cosmetic composition. The l cithin product also may be r at least substantially compris the sp cific compound id ntified as lecithin.

The lecithin mat rial may include phosphati- dylcholine together with other phospholipids and neutral fat. It has surprisingly been found that a non-

hydrogenated lecithin may be used in the composition the subject of the present invention. It is unnecessary to hydrogenate the lecithin to avoid the development of unpleasant odour. Also the emulsifying activity of the lecithin provides a suitable carrier for other compounds, including other phospholipids, and makes them more available to the skin than does a hydrophobic material.

The phospholipid material may be present in any suitable amounts. The phospholipid material may be present in an amount of from approximately 0.1 to 30% by weight, based on the dry weight of the pigment composition, preferably approximately 0.25 to 7.5% by weight, more preferably approximately 0.75 to 5% by weight.

Accordingly, in a preferred aspect there is provided a pigment composition including

approximately 70 to 99.9% by weight, based on the dry weight of the pigment composition of a pigment extender selected from the group consisting of talc, kaolin, natural and synthetic micas, other micas, magnesium carbonate, calcium carbonate, aluminum silicate, magnesium silicate, calcium silicate, clay, bentonite, montmorillionite, calcite, chalk, titanated mica, bismuth oxychloride, boron nitride, silica beads, plastic beads such as acrylics, nylons, natural dyestuffs and mixtures thereof;

0 to approximately 25% by weight of a pigment selected from the group consisting of titanium dioxide, zinc oxide, zirconium dioxide, red iron oxide, yellow iron oxide, black iron oxide, ultramarine blue, Prussian blue, chromium oxide, chromium hydroxide and mixtures thereof; and

approximately 0.1 to 30% by weight of a non-hydrogenated phospholipid material treated with a surface modifying agent selected from the group consisting of fatty acids, fatty acid esters or fatty acid triglycerides, all suitable and cosmetically approved silicones, dimethicones, cyclomethicones, teflon, and mixtures thereof.

The surface modifying agent may include oleic, palmitic, stearic, linoleic or linolenic acid, or mixtures thereof. The fatty acid esters may include, or be selected from the group consisting of, isocetyl stearate, diisopropyl dimerate, n opentanoate , isocetylstearyl st arat , isopropyl isostearate, diisostearyl

dilinoleat octadecyl palmitate, and mixtures thereof. For xample, isocetyl stearyl stearate and diisopropyl dim rat have been found to be suitable.

The triglycerides may include, or be selected from the group consisting of, caprylic acid, caprylic/capric triglycerides, caprylic/capric linoleic acid, dicaprylate, dicaprate, hydrogenated palm oil, hydrogenated coconut oil, glyceryl stearate, cocoglycerides or hydrogenated soybean oil.

The silicones may include, or be selected from the group consisting of, dimethicone, simethicone, cyclomethicone and mixtures thereof. The silicon component may be provided in the form of a liquid, wax or gum.

Desirably the surface modifying agent may include a fatty acid ester component, optionally together with a fatty acid, triglyceride or silicone component, vitamins such as vitamin E or A, all proteins such as lauroyl lysine, leucine or any suitable protein for treatment of the skin.

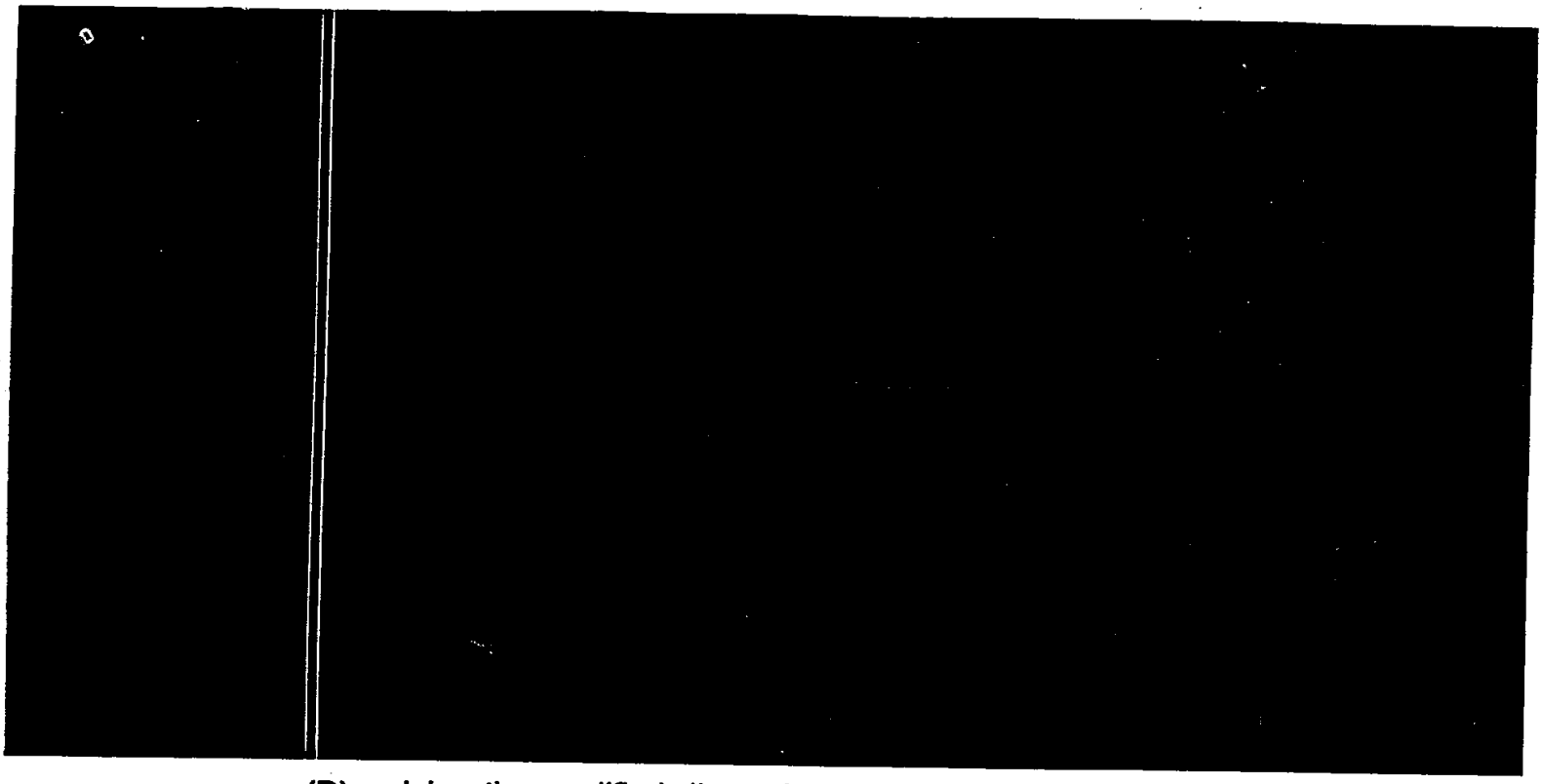
The products produced can vary, with the selection of surface modifying agent or mixture thereof, in transparency, texture, hydrophilicity, binding capability, emulsifying capability, oil absorption, treatment to the skin, etc. The resulting formulas are quite stable, have good ageing characteristics, and little odour. Depending upon the surface modifying agent used, the stability of the product will be equal to or better than products produced from using hydrogenated lecithins.

The surface modifying agent may be present in any suitable effective amounts. The surface modifying agent may be present in amounts of from approximately 0.05 to 10% by weight, based on the dry weight of the pigment composition, preferably approximately 0.1 to 2.5% by weight, more preferably approximately 0.1 to 1% by weight.

The pigment compositions according to the present invention may be prepared in any suitable manner. Desirably, the pigment composition may be prepared utilising a relatively small amount of solvent.

Accordingly, in a further aspect f the present inv ntion there is provided a process for preparing a pigment composition as described above, which process includes

(A) providing



(D) mixing the modified dispersion or solution with the pigment extender and optionally the pigment; and

(E) subjecting the resulting dispersion or solution to a drying step.

In a preferred aspect, the phospholipid material includes a lecithin material. The phospholipid material may be mixed with water to form an aqueous dispersion. The surface modifying agent may be added to the aqueous dispersion of phospholipid material in any suitable manner and in any suitable order. Desirably, the phospholipid material is added to water at approximately room temperature, and is mixed vigorously using a high speed dispersing machine until the phospholipid material is completely dispersed. The surface modifying agent can then be added to the dispersion.

The dispersion step may be conducted at room temperature or at temperatures up to approximately 80°C if desired, to aid in the dispersion process.

In an alternative aspect, the liquid is an organic liquid such as an organic alcohol. The organic alcohol may be selected from methanol, ethanol, isopropyl alcohol or mixtures thereof. In this aspect, the phospholipid material is solubilised in th organic liquid. The solution may be formed at elevated temperature, but below the boiling point of the liquid. However a liquid with a low boiling point is preferred as this aids in the drying step discuss d below.

In the mixing step according to the process of the present invention, the disp rsion or solution formed as discussed above is added to the dry

pigment/pigment extender and vigorously mixed such that the dispersion or solution thoroughly contacts the surface of the pigment/pigment extender. The mixing process may be conducted at approximately room temperature.

In an alternative aspect, the surface modifying agent may be added to the pigment extender before the addition of the phospholipid material. In this embodiment the process for preparing the composition of the invention includes a process for preparing a pigment composition, which process includes

(A) providing

a pigment extender;

optionally a pigment

a non-hydrogenated phospholipid material;

a surface modifying agent selected from the group consisting of fatty acids, fatty acid esters, fatty acid triglycerides, silicones or mixtures thereof; and

an aqueous or organic liquid;

(B) forming a first mixture of the pigment extender and optional pigment and the surface modifying agent.

(C) forming a second mixture of the phospholipid material and the liquid.

(D) mixing the first and second mixtures such that the surface modifying agent and phospholipid material thoroughly contact the surface of the pigment extender and optional pigment; and

(E) subjecting the resulting mixture to a drying step to remove the aqueous or organic liquid.

Desirably the pigment or extender material is a talc material, the phospholipid material is a lecithin material and the surface modifying agent is a fatty acid ester.

The resulting solution or mixture is formed in step (D) of either process subjected to a drying step. The drying step may be conducted in any suitable manner. The drying step may be conducted at temperatures of approximately 50 to 80°C, preferably approximately 55 to 70°C. The drying step may be conducted in a drying oven. In a preferred aspect, the treated pigment/pigment extender may be treated by using high temperature steam to heat an external jacket in order to achieve the drying step.

Th product so formed may be in the form of a dry powder.

If desired, the product may be subjected to a disaggregation stage, such as a crushing or grinding step, to break down any agglomerates which form on drying. For example where talc is used as the pigment extender, the talc may be treated in a high shear mixer to achieve disaggregation.

In a further aspect of the present invention, there is provided a cosmetic composition including

a pigment extender;

optionally a pigment; and

a non-hydrogenated phospholipid material including

a surface modifying agent selected from the group consisting of fatty acids, fatty acid esters or fatty acid triglycerides, silicones, and mixtures thereof.

The cosmetic composition may include any standard compounding ingredients normally used in the preparation of cosmetics. Various other additives may be included into the cosmetic composition including: sunscreen agents, softening agents, hydrating agents (sorbitol, glycerine), cicatrisive agents, anti-free radical agents, perfumes and the like. The cosmetic composition may include a supplementary component selected from the group consisting of vitamins such as Vitamin E acetate etc., other phospholipids such as phosphatidylethanolamine, proteins such as lauroyl lysine, or leucine, triglycerides which may act as additional binder systems and/or texture producing vehicles.

The cosmetic composition may take the form of a powder including a pressed powder, foundation, lipsticks, liquid foundation, rouge, eye shadow or the like.

EXAMPLES

The present invention will now be more fully described with reference to the accompanying xamples. It should be understood, h wever, that the d scription following is illustrative only, and should not be tak n as a restriction on the g nerality of the invention described abov .

EXAMPLE 1

To 50g of water add 8g of lecithin and stir vigorously at room t mperature until the lecithin is well dispersed.

To the lecithin dispersion add 1.6 g of isocetyl stearate and continue mixing until well dispersed.

Add 98.25 g of talc to a laboratory blender, e.g. Waring, and pour in 11.1 g of prepared emulsion.

Mix contents at low speed to achieve a good mixture before continuing blending at high speed.

Dry the powder in an oven (75 - 80°C) for at least 2 hours.

The dried talc is placed in a high speed mixer to break up agglomerates formed and produce a fine powder having an average particle size of approximately 10 μm (by granulometry) or 4 μm (by Sedigraph).

The phospholipid content is 64% of the coating while the fatty acid content is 36%. The resulting formula is quite stable, with excellent aging properties, excellent slip characteristics and a creamy texture with good adhesion properties and spreadability. The coating is a 1.75% addition onto an extremely pure talc substrate resulting in a high brightness product with minimal "yellowing" effect.

The properties of the talc, which essentially also are applicable to th resultant coated product, are set out below:

<u>Mineralogy by XRD</u>

Talc	98	%
Asbestiform (CTFA J4-1)	0	%
Dolomite	<1	%
Magnesite	<1	%

<u>Chemical Analysis by XRF (Unmodified)</u>

SiO_2	62,1	%
MgO	32,1	%
Fe_2O_3	<0.1	%
CaO	0.2	%

MnO		0.2	%
Al_2O_3		<0.01	%
Heavy Metals (USPXXII)		<40	ppm
Fluoride (FCC)		<20	ppm

Optical Properties

Reflectance (G.E.)		91,5	%
Refractive Index		1,57	

Chemical Properties

Loss on Ignition (unmodified)	1000°, 60 min	5,1	%
Loss on Ignition (modified)	1000°, 60 min	6,8	%
pH	10% Dilution	8,5	

Physical Properties

Moisture (110°C)	<0,2	%
Bulk Density (CTFA C8-1)	0,45	g/cm^3
Tapped Density (CTFA C7-1)	0,69	g/cm^3
Hardness (Mohs)	1	
Density	2,7	g/cm^3

Particle Size Distribution

Sedigraph 5100 (unmodified)

< 16.5 µm	98%
< 10 µm	92%
< 5 µm	65%
< 2 µm	22%

Median Particle Size (d50) 3.8 µm

EXAMPLE 2

Mix 1.4 ml of diisopropyl dimerat with 1.25 ml of m thanol by drawing solutions into a 5 ml syringe. Shake syringe vigorously.

Add emulsion slowly from the syringe to 15 g lecithin while mixing.

Place contents into water bath (65°C) and stir mixture. Continue until the mixture is sufficiently fluid to pour.

Add sufficient of lecithin dispersion to 98.25 g of talc (in Waring blender) to achieve required lecithin loading.

Mix contents at low speed and then at high speed.

Place talc in oven at 75 to 80°C for 60 minutes.

Finally, it is to be understood that various other modifications and/or alterations may be made without departing from the spirit of the present invention as outlined herein.

Claims

1. A pigment composition including

a pigment extender; and

optionally a pigment;

and wherein the pigment extender and optional pigment are coated by a non-hydrogenated phospholipid material, and a surface modifying agent selected from the group consisting of fatty acids, fatty acid esters or fatty acid triglycerides, silicones, and mixtures thereof.

2. A pigment composition according to claim 1, including

approximately 70 to 99.9% by weight, based on the dry weight of the pigment composition of a pigment extender selected from the group consisting of talc, kaolin, natural and synthetic micas, magnesium carbonate, calcium carbonate, aluminium silicate, magnesium silicate, calcium silicate, clay, bentonite, montmorillionite, calcite, chalk, titanated mica, bismuth oxychloride, boron nitride, silica beads, plastic beads such as acrylics, nylons, natural dyestuffs and mixtures thereof;

0 to approximately 25% by weight of a pigment selected from the group consisting of titanium dioxide, zinc oxide, zirconium dioxide, red iron oxide, yellow iron oxide, black iron oxide, ultramarine blue, Prussian blue, chromium oxide, chromium hydroxide and mixtures thereof; and

approximately 0.1 to 30% by weight of a non-hydrogenated phospholipid material and surface modifying agent selected from the group consisting of fatty acids, fatty acid esters or fatty acid triglycerides, silicones, and mixtures thereof.

3. A pigment composition according to claim 2, wherein the pigment extender includes a talc.

4. A pigment composition according to claim 2, wherein the non-hydrogenated phospholipid material includes a lecithin material.

5. A pigment composition according to claim 2, wherein the surface modifying agent is pressed in an amount from approximat ly 0.05 to 10% by weight f the dry weight of the pigment composition.

6. A pigment composition according to claim 5, wherein the surface modifying agent includ s a fatty acid ster component optionally together with a fatty acid, triglyceride, and/or silicone component.

7. A pigment composition according to claim 6, wh rein the fatty acid ester is selected from the group consisting of isocetyl stearate, diisopropyl dimerate, neopentanoate, isocetylstearyl stearate, octadecyl palmitate, and mixtures thereof.

8. A process for preparing a pigment composition, which process includes

(A) providing

a pigment extender;

optionally a pigment

a non-hydrogenated phospholipid material;

a surface modifying agent selected from the group consisting of fatty acids, fatty acid esters, fatty acid triglycerides, silicones or mixtures thereof; and

an aqueous or organic liquid;

(B) forming a dispersion or solution of the phospholipid material with the liquid;

(C) adding the surface modifying agent to the dispersion or solution so formed;

(D) adding the pigment extender and optionally the pigment to the dispersion or solution such that the dispersion or solution thoroughly contacts the surface of the pigment extender and optional pigment; and

(E) subjecting the resulting dispersion or solution to a drying step.

9. A process according to claim 8, wherein the phospholipid material is mixed with water to form an aqueous dispersion, and the surface modifying agent is added to the dispersion so formed.

10. A process according to claim 8, wherein the phospholipid material is liquified in an organic liquid, and the surface modifying agent is added to the mixture.

11. A process for preparing a pigment composition, which process includes

(A) providing

a pigment xtender;

optionally a pigment

a non-hydrog nat d phospholipid mat rial;

a surface modifying agent selected from the group consisting of fatty acids, fatty acid esters, fatty acid triglycerides, silicones or mixtures thereof; and

an aqueous or organic liquid;

(B) forming a first mixture of the pigment extender and optional pigment and the surface modifying agent.

(C) forming a second mixture of the phospholipid material and the liquid.

(D) mixing the first and second mixtures such that the surface modifying agent and phospholipid material thoroughly contact the surface of the pigment extender and optional pigment; and

(E) subjecting the resulting mixture to a drying step to remove the aqueous or organic liquid.

12. A process according to any one of claims 8 to 11, wherein the pigment extender includes a talc; and the non-hydrogenated phospholipid material includes a lecithin material.

13. A process according to claim 12, wherein the surface modifying agent includes a fatty acid ester selected from the group consisting of isocetyl stearate, diisopropyl dimerate, neopentanoate, isocetylstearyl stearate, octadecyl palmitate, and mixtures thereof.

14. A process according to claim 13, wherein the drying step is conducted at temperatures of approximately 50°C to 80°C.

15. A cosmetic composition including

a pigment extender;

optionally a pigment; and

wherein the pigment extender and optional pigment are coated by a non-hydrogenated phospholipid material, and a surface modifying agent selected from the group consisting of fatty acids, fatty acid esters or fatty acid triglycerides, silicones, and mixtures thereof.

16. A cosmetic composition according to claim 15, including

approximately 70 to 99.9% by weight, based on the dry weight of the pigment composition of a pigment extender selected from the group consisting of talc, kaolin, natural and synthetic micas, magnesium carbonate, calcium carbonate, aluminium silicate, magnesium silicate, calcium silicate, clay,

bentonite, montmorillionite, calcite, chalk, titanat d mica, bismuth oxychloride, boron nitride, silica beads, plastic beads such as acrylics, nylons, natural dyestuffs and mixtures thereof;

0 to approximately 25% by weight of a pigment selected from the group consisting of titanium dioxide, zinc oxide, zirconium dioxide, red iron oxide, yellow iron oxide, black iron oxide, ultramarine blue, Prussian blue, chromium oxide, chromium hydroxide and mixtures thereof; and

approximately 0.1 to 30% by weight of a non-hydrogenated phospholipid material and surface modifying agent selected from the group consisting of fatty acids, fatty acid esters or fatty acid triglycerides, silicones, and mixtures thereof.

17. A cosmetic composition according to claim 15, wherein the pigment extender includes a talc.

18. A cosmetic composition according to claim 15, wherein the non-hydrogenated phospholipid material includes a lecithin material.

19. A cosmetic composition according to claim 15, further including a supplementary component selected from the group consisting of vitamins, other phospholipids, and other triglycerides.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU 94/00653

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.[6] C09C 3/08, 1/42 A61K 9/127, 7/021

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC: C09C 3/08, 1/42, A61K 9/127, 7/021

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base, and where practicable, search terms used)
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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	WO,A, 90/06103 (THE BOOTS COMPANY PLC) 14 June 1990 (14.06.90) page 2 line 4 - page 3 line 2, examples, claims	1, 11, 15
A	WO,A, 94/15580 ((THE PROCTOR AND GAMPLE COMPANY) 21 July 1994 (21.07.94) page 4 lines 18-25, page 6 line 28 - page 8 line 2, examples	1, 11, 15
A	US,A, 3017283 (BENNETCH, Leonard M. et al.) 16 January 1962 (16.01.62) whole document	1, 11
A	FR,A, 1479240 (FARBENFABRIKEN BAYER AKTIENGESELLSCHAFT) 28 March 1967 (28.03.67) claims, examples	1, 11

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance
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Date of the actual completion of the international search	Date of mailing of the international search report
19 January 1995 (19.01.95)	27 Jan 1995 (27.1.95)

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate of the relevant passages	Relevant to Claim No.
A	FR,A, 1542439 (AGRASHELL INC) 9 September 1968 (09.09.68) claims, examples	1, 11
A	Patent Abstracts of Japan, C-422, page 159, JP,A, 61-286309 (SHISEIDO CO LTD) 16 December 1986 (16.12.86) abstract	1, 11, 15
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